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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,767	12/27/2001	Yoshu Yoshiba	NITT.0051	9780

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EXAMINER	
MEHTA, ASHWIN D	

ART UNIT	PAPER NUMBER
1638	

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/026,767	YOSHIBA ET AL.	
	Examiner	Art Unit	
	Ashwin Mehta	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 October 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12272001 & 9052002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The entry for Yoshiba et al. in the IDS submitted September 5, 2002, was lined through only because this citation appears in, and was initialed by the Examiner in, the IDS submitted December 27, 2001.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

3. Claims 2-6, 10-12, 16-23 are objected to for the following reasons:

In claims 2-6: "thanliana" is misspelled.

Claims 10 and 16-23 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form. The claims attempt to limit the plant of their parent claims to be rice. However, the only plant type encompassed by the parent claims is rice.

Claims 12 and 32-39 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 11 and 24-31, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording,

it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). Both sets of claims are directed to a seed of the rice plant of the claim from which they depend. The latter set of claims attempt to limit the rice plant of the claims from which they depend to be rice. However this is not a limitation, for the reasons discussed above.

In claim 12: the claim is missing the period punctuation mark.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1, 10, 11, and 12 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1 reads on a rice plant pre se, containing a rice gene, which is found in nature and thus, is unpatentable to applicant. The plant, as claimed, has the same characteristics as those found in nature and therefore does not constitute patentable subject matter. See American Wood v. Fiber Disintegrating Co., 90 U.S. 566 (1974), American Fruit Growers v. Brodgex Co., 283 U.S. 2 (1931), Funk Brothers Seed Co. v. Kalo Inoculant Co., 33 U.S. 127 (1948), Diamond v. Chakrabarty, 206 USPQ 193 (1980). It is suggested that claim 1 be amended by inserting the term --transgenic-- into line 1 before the term, "rice" to identify a product that is not found in nature.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 7, 9-12, 15, and 21-39 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1: the claim is indefinite because it is not exactly clear that the claimed plant is transgenic, since SEQ ID NO: 1 is the nucleotide sequence of a rice gene. It is suggested that the term, --transgenic-- be inserted in line 1 before "rice".

In claim 7: the recitation, "introducing said vector according to claim 6 into calli derived from a rice plant to grow said calli" renders the claim indefinite. It is not clear what growing calli by introducing nucleic acid into it means.

In claims 7, 8, 13, and 14: the recitation, "plant body" renders the claims indefinite. It is not clear if this recitation is referring to a plant part, or a whole, mature plant. Note that if it refers to a plant part, then the recitation is inconsistent with the preambles of the claims, which indicate that the claims are either directed to a rice plant or a method to produce a rice plant. It is suggested that "body" be deleted from the claims.

In claim 9: the claim is confusing. The claim is drawn to a rice plant, and appears to be a plant that is obtained from a cross involving a rice plant that comprises the vector of claim 6. Claim 9 does not indicate what is crossed with the rice plant comprising the vector of claim 6. It is also unclear whether the rice plant of claim 9 has inherited the vector comprised within the rice plant comprising the vector of claim 6.

In claims 11, 12, 24-39: the recitation, "said seed having been collected from said rice" renders the claims indefinite. It is not clear if the claimed seeds are those which produce the plants of the respective parent claims, or if they represent progeny produced by crossing the plant of the parent claim with another plant. If it is the latter, note that the claims do not properly depend from their parent claims, as there are no intervening claims drawn to a method comprising crossing the plant of the parent claim with another rice plant.

Further in claims 11, 12, and 24-39: it is not clear if the claimed seed comprise the recited genes. It is suggested that the claims be amended to indicate that the seeds comprise said genes.

In claim 13: the recitation, "using Agrobacterium tumefaciens to grow said calli" renders the claims indefinite. It is not clear what is meant by this recitation. It is not clear what is meant by using bacteria to grow a plant tissue.

In claim 14: the term, "colony" renders the claim indefinite. It is not clear what the colony is made of, or what plant tissue the term is representing.

In claim 15: the claim is confusing. It is not clear what is being crossed with the "rice plant obtained by introducing said vector according to claim 6 by genetic engineering." The recitation, "and introducing said vector according to claim 6 therein" also renders the claim indefinite. It is not clear if the latter recitation is referring to the introduction step mentioned in the former recitation, or to the introduction of the vector into a progeny rice plant.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-39 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claims are drawn towards any rice plant in which the P5CS gene of rice containing SEQ ID NO: 1, or the P5CS gene of Arabidopsis thaliana containing SEQ ID NO: 2, or the antisense gene of the ProDH gene of Arabidopsis thaliana (SEQ ID NO: 3), or the rice P5CS gene containing SEQ ID NO: 1 or an Arabidopsis P5CS gene containing SEQ ID NO: 2, and the antisense gene of an Arabidopsis thaliana ProDH gene containing SEQ ID NO: 3, has been introduced; or a vector in which any of a rice P5CS gene containing SEQ ID NO: 1, Arabidopsis P5CS gene containing SEQ ID NO: 2, and the antisense gene the Arabidopsis ProDH gene containing SEQ ID NO: 3 has been introduced, or either of said P5CS genes and said antisense ProDH gene in tandem, have been introduced; a rice plant obtained by introducing said vector into calli and regenerating a plant body, or obtained by introducing said vector into a protoplast, or obtained by crossing with a rice plant obtained by introducing said vector; or a seed of said rice plant collected from said plant; or a production method of a rice plant, comprising introducing said vector into calli using Agrobacterium tumefaciens and regenerating a plant body, or by introducing said vector into a protoplast by electroporation, or by crossing a rice plant obtained by introducing said vector.

The specification asserts that plants experiencing high-salinity or drought accumulate proline in the cytoplasm. Proline is produced from glutamic acid by P5C synthetase (P5CS) and P5C reductase, and that proline is metabolized into glutamic acid by proline dehydrogenase

(ProDH) and P5C dehydrogenase (page 1). The specification indicates that P5CS is rate limiting for proline synthesis in plants during water stress, and that ProDH is rate limiting for proline metabolism during recovery from water stress (page 2). The specification teaches the construction of vectors comprising either the rice P5CS cDNA (SEQ ID NO: 1), the Arabidopsis P5CS cDNA (SEQ ID NO: 2), in sense or antisense orientation, the Arabidopsis ProDH cDNA (SEQ ID NO: 3) in antisense orientation, or either of the P5CS cDNAs in sense orientation and the ProDH cDNA in antisense orientation. Rice calli were transformed with one of the vectors via Agrobacterium, and transgenic rice plants regenerated (pages 11-16). Proline was extracted from seedlings of the T2 or T3 generation, and the concentration determined by HPLC. Proline was found to accumulate in the transgenic plants comprising a P5CS cDNA in sense orientation and the ProDH cDNA in antisense orientation. Proline content was accumulated to a much higher extent in transgenic plants comprising a P5CS cDNA in sense orientation and the antisense ProDH cDNA (pages 16-18). Transgenic plants were also tested for salinity tolerance at a concentration of 250 mM NaCl. The specification indicates that non-transgenic plants died within 5 days under these conditions, whereas 65% of transgenic lines that showed proline accumulation were still viable at day 5 (page 19).

However, the specification does not clearly indicate which of the transgenic lines that showed proline accumulation were tested. It is not clear that all of the transgenic lines that showed an accumulation of proline remained viable. The art teaches that while proline accumulation in plants is correlated with osmotic stress tolerance, that it may also be toxic to plants. For example, Nanjo et al. (Plant Cell Physiol., 2003, Vol. 44, pages 541-548) teach that mutant ProDH plants, in which ProDH activity was lost due to a T-DNA insertion in the ProDH

gene, showed hypersensitivity to exogenous application of proline. A dose-dependent increase in internal proline accumulation was observed in relation to the externally supplied proline. In the absense of externally supplied proline, the mutant plants grew normally. In the presence of externally supplied proline, root and shoot growth was suppressed and chlorophyll content of shoots was decreased (page 542). It is therefore unclear which of the transgenic plants of the instant invention survived when grown in high salt conditions, given that proline content was known to have increased in the plants, especially in the transgenic plant comprising the P5CS cDNA in sense orientation and the ProDH cDNA in antisense orientation. The specification only ambiguously indicates that several of the transgenic rice lines showing proline accumulation were tested for salinity tolerance, without providing any further detail on their identities (page 19). In the absense of further guidance, undue experimentation would be required to use the claimed invention, if the claimed plants are not viable in the presence of accumulated proline. See Genentech, Inc. v. Novo Nordisk, A/S, 42 USPQ2d 1001, 1005 (Fed. Cir. 1997), which teaches that "the specification, not the knowledge of one skilled in the art" must supply the enabling aspects of the invention. Given the breadth of the claims, unpredictability of the art, and lack of guidance of the specification as discussed above, undue experimentation would be required by one skilled in the art to make and use the claimed invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 3, 6, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Aoki et al. (Nippon Joshi Daigaku Kiyo, 1999, Vol. 7, pages 45-53, CAPLUS Accession Number 1999 : 500207, Document Number 132 :61678).

The claims are directed toward a rice plant in which the antisense gene of a ProDH gene of Arabidopsis thaliana containing the sequence according to SEQ ID NO: 3 has been introduced; or a vector in which any of a rice P5CS gene containing SEQ ID NO: 1, Arabidopsis P5CS gene containing SEQ ID NO: 2, and the antisense gene the Arabidopsis ProDH gene containing SEQ ID NO: 3 has been introduced, or either of said P5CS genes and said antisense ProDH gene in tandem, have been introduced.

The abstract of Aoki et al. teaches that transgenic rice plants were produced which comprise the Arabidopsis thaliana ProDH cDNA in antisense orientation. It is inherent that the cDNA was comprised within a vector when introduced into the plant.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 2, 6-16, 20-24, 28-32, and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. (Plant Sci. 1998, Vol. 139, pages 41-48) in view of Igarashi et al.

(Plant Mol. Biol., 1997, Vol. 33, pages 857-865), Yoshiba et al. (Plant J., 1995, Vol. 7, pages 751-760), Rashid et al. (Plant Cell Rep., 1996, Vol. 15, pages 727-730), and Shimamoto et al. (Nature, 1989, Vol. 338, pages 274-276).

The claims are drawn towards any rice plant in which the P5CS gene of rice containing SEQ ID NO: 1, or the P5CS gene of Arabidopsis thaliana containing SEQ ID NO: 2, has been introduced; or a vector in which any of a rice P5CS gene containing SEQ ID NO: 1, Arabidopsis P5CS gene containing SEQ ID NO: 2, and the antisense gene the Arabidopsis ProDH gene containing SEQ ID NO: 3 has been introduced, or either of said P5CS genes and said antisense ProDH gene in tandem, have been introduced; a rice plant obtained by introducing said vector into calli and regenerating a plant body, or obtained by introducing said vector into a protoplast, or obtained by crossing with a rice plant obtained by introducing said vector; or a seed of said rice plant collected from said plant; or a production method of a rice plant, comprising introducing said vector into calli using Agrobacterium tumefaciens and regenerating a plant body, or by introducing said vector into a protoplast by electroporation, or by crossing a rice plant obtained by introducing said vector.

Zhu et al. teach the production of transgenic rice plants comprising a vector comprising the cDNA encoding the V. aconitifolia P5CS. The transgenic plants showed an accumulation of proline upon overproduction of P5CS, and an increase in biomass under salt-stress and water-stress conditions compared to non-transformed plants. Second generation transgenic plants were also produced, indicating that seeds from the original transgenic plants were collected.

Zhu et al. do not teach the rice or Arabidopsis cDNAs encoding P5CS, Agrobacterium-mediated transformation of rice calli, or electroporation of rice protoplasts.

Igarashi et al. teach the cDNA (instant SEQ ID NO: 1) encoding rice P5CS; that the P5CS gene in rice is induced by salt, dehydration, and ABA and cold treatment; that proline accumulation was observed as a result of high salt treatment in rice plants; that expression of the P5CS gene and proline accumulation increased steadily in a salt-tolerant rice cultivar; and assert the belief that, upon consideration of their results and previous reports of proline synthesis in Arabidopsis thaliana and Vigna aconitifolia, that it is possible to produce transgenic rice plants for water stress tolerance by proline overproduction as a result of enhancing P5CS activity (pages 857-864).

Yoshiba et al. teach the cDNA (instant SEQ ID NO: 2) encoding the Arabidopsis thaliana P5CS; that the gene for P5CS was induced by dehydration, high salt and ABA treatment, with the simultaneous accumulation of proline; that P5CS is the principal enzyme involved in the biosynthesis of proline under osmotic stress (pages 751-758).

Rashid et al. teach a method of producing fertile transgenic rice plants comprising Agrobacterium-mediated transformation of rice calli, and regeneration of transgenic calli into transgenic plants (pages 728-730).

Shimamoto et al. teach a method of producing fertile transgenic plants, comprising transforming rice protoplasts by electroporation, and regenerating transgenic protoplasts into transgenic plants (pages 274-276).

It would have been obvious and within the scope of one of ordinary skill in the art at the time the invention was made to modify the method of producing transgenic rice plants overexpressing P5CS of Zhu et al. by replacing the V. aconitifolia P5CS cDNA with the rice P5CS cDNA taught by Igarashi et al. One would have been motivated to do so, given the

assertion by Igarashi et al. that water-stress tolerant transgenic rice plants can be produced by enhancing P5CS activity. Alternatively, it was also obvious that the mothbean P5CS cDNA of Zhu et al. could have been replaced with the Arabidopsis P5CS cDNA taught by Yoshiba et al. One would have been motivated to do so, given that Yoshiba et al. show teach that P5CS is induced by dehydration, high salt, and ABA treatment, with the simultaneous accumulation of proline, and that P5CS is the principal enzyme in proline biosynthesis under osmotic stress. One obviously could have used any rice transformation method known in the prior art to produce the transgenic plants, including the methods taught by Rashid et al. and Shimamoto et al. One obviously would also have been motivated to cross the transgenic rice plants with other rice plants that do not comprise the rice P5CS cDNA, for the purpose of propagation and production of further rice plants comprising and expressing the rice P5CS cDNA and increasing water and salt stress tolerance.

9. Claims 3, 6-15, 17, 25, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nanjo et al. (FEBS Lett., 1999, Vol. 461, pages 205-210) in combination with Rashid et al. (Plant Cell Rep., 1996, Vol. 15, pages 727-730), and Shimamoto et al. (Nature, 1989, Vol. 338, pages 274-276).

The claims are drawn towards any rice plant in which the antisense gene of the ProDH gene of Arabidopsis thaliana (SEQ ID NO: 3) has been introduced; or a vector in which any of a rice P5CS gene containing SEQ ID NO: 1, Arabidopsis P5CS gene containing SEQ ID NO: 2, and the antisense gene the Arabidopsis ProDH gene containing SEQ ID NO: 3 has been introduced, or either of said P5CS genes and said antisense ProDH gene in tandem, have been

introduced; a rice plant obtained by introducing said vector into calli and regenerating a plant body, or obtained by introducing said vector into a protoplast, or obtained by crossing with a rice plant obtained by introducing said vector; or a seed of said rice plant collected from said plant; or a production method of a rice plant, comprising introducing said vector into calli using Agrobacterium tumefaciens and regenerating a plant body, or by introducing said vector into a protoplast by electroporation, or by crossing a rice plant obtained by introducing said vector.

Nanjo et al. teach transgenic Arabidopsis thaliana plants comprising a vector comprising the cDNA (SEQ ID NO: 3) encoding Arabidopsis ProDH, in antisense orientation; accumulation of proline in the transgenic plants to high levels; increased tolerance of the transgenic plants to freezing and high salinity compared to non-transgenic plants, showing a positive correlation between proline accumulation and stress tolerance in plants (pages 205-209).

Nanjo et al. do not teach transgenic rice plants.

Rashid et al. is discussed above.

Shimamoto et al. is discussed above.

It would have been obvious and within the scope of one of ordinary skill in the art at the time the invention was made to modify the method of producing stress tolerant plants of Nanjo et al. by introducing the vector comprising the ProDH cDNA in antisense orientation into rice, following any transformation procedure, including those taught by Rashid et al. or Shimamoto et al. One would have been motivated to express the antisense ProDH sequence in rice plants, as an increase in water and salt tolerance of a crop plant as economically important as rice was obviously desirable.

10. Claims 4, 5, 18, 19, 26, 27, 34, and 35 rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. (Plant Sci. 1998, vol. 139, pages 41-48) in view of Igarashi et al. (Plant Mol. Biol., 1997, Vol. 33, pages 857-865), Yoshiba et al. (Plant J., 1995, Vol. 7, pages 751-760), Rashid et al. (Plant Cell Rep., 1996, Vol. 15, pages 727-730), and Shimamoto et al. (Nature, 1989, Vol. 338, pages 274-276), as applied to claims 1, 2, 6-16, 20-24, 28-32, and 36-39 above, and further in view of Nanjo et al. (FEBS Lett., 1999, Vol. 461, pages 205-210).

Claims 4, 5, 18, 19, 26, 27, 34, and 35 are drawn towards a rice plant in which a rice P5CS gene containing SEQ ID NO: 1 or an Arabidopsis P5CS gene containing SEQ ID NO: 2, and the antisense gene of an Arabidopsis thaliana ProDH gene containing SEQ ID NO: 3 have been introduced, or introduced in tandemly connected relation to each other; a seed collected from said rice plant.

Zhu et al. in view of Igarashi et al., Yoshiba et al., Rashid et al., and Shimamoto et al. teach a method of producing fertile transgenic rice plants expressing either the rice or Arabidopsis P5CS genes, containing SEQ ID NO: 1 or SEQ ID NO: 2, respectively, as discussed above.

Zhu et al. in view of Igarashi et al., Yoshiba et al., Rashid et al., and Shimamoto et al. do not teach the Arabidopsis ProDH gene containing SEQ ID NO: 3 in antisense orientation.

Nanjo et al. teach water and salt tolerant transgenic plants comprising a vector comprising the cDNA (SEQ ID NO: 3) encoding Arabidopsis ProDH, in antisense orientation, as discussed above.

It would have been obvious and within the scope of one of ordinary skill in the art at the time the invention was made to further modify the method of producing transgenic rice plants of

Zhu et al. in view of Igarashi et al., Yoshiba et al., Rashid et al., and Shimamoto et al., by including in the vector introduced into the rice plants, the antisense ProDH sequence taught by Nanjo et al. One would have been motivated to do so, given the demonstration by Nanjo et al. teach that suppressing proline degradation by expressing the antisense ProDH sequence lead to increased proline production and stress tolerance. It was obvious that expression of both the cDNAs of Igarashi et al. or Yoshiba et al., along with the antisense sequence of Nanjo et al., would lead to increase in proline and increased stress tolerance in the transgenic rice plants. It also would have been obvious to place the P5CS and antisense ProDH sequences in tandemly connected relation to each other in the transformation vector, and that such an arrangement is an optimization of process parameters.

11. Claims 1-39 are rejected.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ashwin Mehta whose telephone number is 571-272-0803. The examiner can normally be reached from 8:00 A.M to 5:30 P.M. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached at 571-272-0804. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306 for regular communications and 703-872-9307 for After Final communications. Information regarding the status of an application may be obtained from

the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 18, 2004

Ashwin D. Mehta, Ph.D.
Primary Examiner
Art Unit 1638